

**AMENDMENTS TO THE CLAIMS**

1. (Original) A method of soil-gas analysis prospecting including the steps of:
  - collecting a plurality of soil samples;
  - subjecting each soil sample to soil-gas analysis for a plurality of signature gases to provide a signature gas value for each signature gas which together comprise a gas analysis subset for each sample;
  - performing a multivariate discriminant analysis by
    - providing for each sample a plurality of gas ratios by dividing a product of two or more signature gas values by a product of two or more signature gas value for each of the signature gases; and
    - summing the gas ratios for each sample in the subset to provide a composite summed ratio parameter;
  - and
  - comparing the composite summed ratio parameter measured from the survey samples with the same parameter measured on samples having predetermined characteristics for a known mineralisation.
  
2. (Original) A method of soil geochemistry analysis prospecting including the steps of:
  - collecting a plurality of soil samples;
  - separating selecting component minerals from the samples to provide a corresponding plurality of component enriched samples;

subjecting each said component enriched sample to a geochemical analysis of a plurality of species discernable in said component enriched sample by said geochemical analysis, to provide a species analysis for each said component enriched sample and said species analyses together providing a composite analysis data set;

performing multivariate discriminant analysis according to Claim 1 on the composite analysis data set, and

comparing results of the multivariate discriminant analysis with one or more samples having a known mineralisation.

3. (Original) A method of soil geochemistry analysis prospecting including the steps of:  
collecting a plurality of soil samples;  
separating the clay minerals from the samples to provide a corresponding plurality of clay enriched samples;

subjecting each said clay enriched sample to an analysis of a plurality of adsorbed and/or absorbed species desorbable from said clay sample by said analysis, to provide a desorbed species analysis for each said sample and said desorbed species analyses together providing a composite analysis data set;

performing multivariate discriminant analysis according to Claim 1 on the composite analysis data set, and

comparing results of the multivariate discriminant analysis with one or more samples having a known mineralisation.

4. (Currently Amended) A method according to ~~any one of Claims 1 to 3~~ claim 1, wherein the soil samples are treated to provide clay enriched samples which are subjected to a description process for desorbing desorbable species from the clay.

5. (Original) A method according to Claim 4, wherein the desorption process includes soil desorption pyrolysis.

6. (Currently Amended) A method according to ~~any one of the preceding claims~~ claim 1, wherein the gas ratios are provided by dividing a product of two gas values by a product of two other gas values.

7. (Original) A method according to Claim 6, wherein the soil or signature gas analysis is performed for forty-four signature gases using mass spectrometry.